HERAMBA CHANDRA COLLEGE
DEPARTMENT OF MATHEMATICS

Programme for B.Com

Table 1 Programme Outcomes (PO) on completing B.Com

Sl. No.	Programme Outcomes
Critical Thinking (PO1)	This outcome involves training students to think critically and independently. Critical thinking skills help graduates make informed decisions and solve problems effectively.
Problem-solving (PO2)	B.Sc programmes should equip students with problem-solving skills. Graduates should be capable of identifying complex issues, analysing root causes, and proposing effective solutions. This skill is valuable in both personal life and professional careers.
Interdisciplinary Knowledge (PO3)	Depending on their chosen major, minor and interdisciplinary subjects within the B.Sc programme, students should develop expertise in their specific area of study, whether it's statistics, computer science, economics, or another field. This specialized knowledge provides depth in their chosen discipline.
Employability (PO4)	On graduating, the students will be eligible for employment in the field of education and other industries like analytics, pharmaceuticals etc. Their skills in comprehension of general social phenomena around them place them in an ideal situation for such jobs. They will also be able to appear for competitive examinations conducted for public sector jobs.

HERAMBA CHANDRA COLLEGE
DEPARTMENT OF MATHEMATICS

Table 2 Programme Specific Objectives (PSO) on completing B.Com

SL No.	On completing B.Com, the students will be able to
PSO 1	Students of Commerce will be acquainted with the concept, factors, methods and historical development of Mathematics.
PSO 2	Students can gather knowledge about Mathematics and explain the application of Mathematics in different fields.
PSO 3	They will understand the importance of Mathematics and their uses in real life.
PSO 4	Develop essential knowledge and skill of planning and management which is an essential part of Mathematics.
PSO 5	They will understand the concept and application of modern technological development and will get acquainted with the curriculum development, inclusiveness and process of evaluation and its implementation in the field of Commerce.
PSO 6	Understand and apply the concept and will develop skill in analyzing descriptive measures in Mathematics.

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Course Outcomes (CO) are mapped to the revised Bloom's Taxonomy using the following abbreviations:

R: Remembering

U: Understanding

Ap: Applying

An: Analysing

E: Evaluating

C: Creating

HERAMBA CHANDRA COLLEGE
DEPARTMENT OF MATHEMATICS

Semester- I (July to December)

Programme	B.Com
paper Code	GE 1.1 Chg
GE1	Statistics
Year and Semester	1st year 1st semester
Prerequisite Course	Nil
Course Objective	Knowledge of Introduction to Statistics

Table 3 Course Outcome (CO) on completing Unit-1 to Unit-5

Units as given in syllabus of CU	Course Outcome	On completing the course, the student will be able to:	PSO Addressed	Cognitive level
Unit-1 Fundamentals	CO1	Gain a basic idea of the meaning and understand the nature, scope and aims of Statistics.	1 and 3	R, U, An, Ap
Unit-2 Central tendency	CO2	Explain the different types of measures.	1 and 3	R, U, An, Ap
Unit-3 Dispersion	CO3	Become aware of applications of different measures.	1 and 3	R, U, An, Ap
Unit-4 Skewness & Kurtosis	CO4	Be acquainted with the concepts.	1 and 3	R, U, An, Ap
Unit-5 Interpolation	CO5	Be acquainted with the concepts & its Applications.	1 and 3	R, U, An, Ap

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	2	3
CO2	3	3	3	3	2	3
CO3	3	3	3	3	2	3
CO4	3	3	3	3	2	3
CO5	3	3	3	3	2	3
Average						

HERAMBA CHANDRA COLLEGE
DEPARTMENT OF MATHEMATICS

Semester: I
Core Course: Microeconomics & Statistics-I
Paper Code: GE 1.1 Chg

Total Marks: 100 [Theory (Th) 40 + Internal Assessment 10+Attendance: 10] Total Credits =6 , No. of Lecture hours (Theory): 40

Table 5				
Units of the Course	Content	Lecture No	Faculty	Date and sign
Unit-1	Fundamentals:Definition of Statistics, Scope and limitation of Statistics,Attribute and variable,Primary and secondary data, Method of data collection, Tabulation of data, Graphs and charts, Frequency distribution, Diagrammatic presentation of frequency distribution	8	SR, AM, SG	
Unit-2	Measures of Central Tendency:Meaning of central tendency, Common measures – mean (A.M., G.M., H.M.) median and mode, Partition values- quartiles, deciles and percentiles, Applications of different measures	8	SR, SG, DH, AM	
Unit -3	Measures of Dispersion:Meaning of dispersion,Common measure– range, quartile deviation, mean deviation and standard deviation; Relative measures of dispersion,Combinedstandard deviation,Applications of different measures.	**8**	AM, MD, SG	
Unit - 4	Moments, Skewness and Kurtosis: Different types of moments and their relationships, Meaning of skewness and kurtosis, Different measures of skewness, Measure of kurtosis,Applications of different measures.	**8**	AM, SG	
Unit-5	Interpolation: Finite differences, Polynomial	**8**	AS,	

HERAMBA CHANDRA COLLEGE
DEPARTMENT OF MATHEMATICS

	function, Newton's forward and backward interpolation formula, Lagrange's interpolation formula.		AM, SR	

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1			2	2	2			
CO2			2	2	2	2		
CO3	3		2	2	2	2		
CO4	3		2	2	2	2		
CO5	3		2	2	2	2		
1-Low(40%<Achievement<50%), 2- Medium (50%<Achievement<60%), 3- High (60%<Achievement)								

Semester –III (July to December)
Core Course –Business Mathematics & Statistics
Paper Code: GE 3.3 Chg

Programme	B.Com
Course Code	GE 3.3 Chg
Course Name	Business Mathematics & Statistics
Year and Semester	2nd year 3rd semester
Prerequisite Course	Nil
Course Objective	To develop an understanding of mathematics & statistics

Group, Section and Unit as given in syllabus of CU	Course outcome	On completing the course, the student will be able to:	PSO Addressed	Cognitive level
Unit 1 Permutation,Combination, log,	CO1	Develop knowledge of mathematics	All	All

HERAMBA CHANDRA COLLEGE
DEPARTMENT OF MATHEMATICS

Compound interest & annuities				
Unit 2 Correlation & Regression, Index No., Time Series, Probability theory	CO2	Develop a critical understanding of different statistical methods	All	All

				PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1				3	3	3	3	3	3	
CO2				3	3	3	3	3	3	
Average										
Correlation level				1-Low(40%<Achievement<50%), 2- Medium (50%<Achievement<60%), 3- High (60%<Achievement)						

Total Marks: 100 [Theory(Th) 80+ Internal Assessment 10+Attendance: 10] Total Credits=6 , No. of Lecture hours: 80

Section/ Unit of the Course	Content	Lecture No	Faculty	Date and sign
Unit 1	Permutations and Combinations: Definition, Factorial Notation, Theorems on Permutation, Permutations with repetitions, Restricted Permutations;Theorems on Combination, Basic identities, Restricted Combinations. 2 Set Theory: Definition of set, Presentation of sets, Different types of sets- Null set, Finite and infinite Sets, Universal set, Subset, Power set etc.; Set Operations, Law of algebra of Sets. 3 Binomial Theorem: Statement of the theorem for positive integral index, General term, Middle term, Simple properties of binomial coefficients. 4 Logarithm: Definition, Base and Index of Logarithm, General properties of	**10**	**SR,AS,AM,DH,MD**	

	Logarithm, Common Problems. 5 Compound Interest and Annuities:Simple AP and GP Series, Different types of interest rates, Net present value, Types of annuities, Continuous compounding, Valuation of simple loans and debentures, Problems relating to Sinking Funds.			
Unit 2	Correlation and Association:Bivariate data, Scatter diagram, Pearson's correlationcoefficient, Spearman's rank correlation, Measures of association of attributes. [8 L /8Marks] 7. Regression Analysis: Least squares method, Simple regression lines, properties of regression, Identification of regression lines. [8 L /8Marks] 8. Index Numbers: Meaning and types of index numbers, Problems of constructing index numbers, Construction of price and quantity indices, Test of adequacy, errors in index numbers, Chain base index numbers; Base shifting, Splicing, Deflating, Consumer price index and its uses. [8 L /8Marks] 9. Time Series Analysis: Causes of variation in time series data, Components of time series, additive and multiplicative models, Determination of trend by semi-average, moving average and least squares(of linear, quadratic and exponential trend) methods; Computation of seasonal Indices by simple average, ratio-to-moving average, ratio-to-trend and link relative methods; Simple forecasting through time series data. [8 L /8Marks] 10. Probability Theory: Meaning of probability; Different definitions of probability; Conditional probability; Compound probability; Independent events, Simple problems.	**40**	**SG, AM, SR**	

HERAMBA CHANDRA COLLEGE
DEPARTMENT OF MATHEMATICS

	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1				2	2	2	3	2	2	
CO2				2		2	3	2	2	
Correlation level				1-Low(40%<Achievement<50%), 2- Medium (50%<Achievement<60%), 3- High (60%<Achievement)						

Semester –V (January-June)
Core Course -
Paper Code: DSE 5.1 A

Total Marks: 100 [Theory(Th) 40 + Internal Assessment 10+Attendance: 10] Total Credits=6 , No. of Lecture hours: 40

Section/ Unit of the Course	Content	Lecture No	Faculty	Date and sign
Unit 1	Functions,Limit and Continuity: Definition of functions, Classification of functions, Different types of functions(excluding trigonometrical functions), Elementary ideas of limit and continuity through the use of simple algebraic functions	8	AS,AM, SR, DH, MD	
Unit 2	Differentiation and Integration: Derivative and its meaning; Rules of differentiation; Geometrical interpretation; Significance of derivative as rate measure; Second order derivatives; Integration as anti-derivative process; Standard forms; Integration by substitution.	8	AS,AM, SR, DH, MD	
Unit 3	Applications of Derivativeand Integration: Maximum and minimum values ; Cost function ; Demand function ; Profit function; Increasing and decreasing functions ; Rate measure, Applied problems on Average cost (AC), Average variable cost (AVC), Marginal cost (MC), Marginal revenue (MR), Simple area calculation by integration method.	8	AS,AM, SR, DH, MD	
Unit 4	Determinants: Determinants upto third order, Elementary properties of	8	AS,AM, SR, DH,	

	determinants, Minors and co-factors, Solution of a system of linear equations by Cramer's Rule (up to three variables		MD	
Unit 5	Matrix: Definition of matrix, Types of matrices, Operations on matrices (addition, subtraction, multiplication), Adjoint of a matrix, Inverse of a matrix , Solution of a system of linear equations by matrix inversion method (up to three variables).	8	AS,AM, SR, DH, MD	

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1		2	3	3	2	2	
CO2		2	3	3	2	2	
CO3		2	3	3	2	2	
CO4		2	3	3	2	2	
CO5		2	3	3	2	2	
Average							